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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,913	11/13/2003	John Donahue	C-2357Re	2383

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EXAMINER	
YUAN, DAH WEI D	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 03/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/712,913	DONAHUE ET AL.	
	Examiner	Art Unit	
	Dah-Wei D. Yuan	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 8-21* is/are pending in the application.

4a) Of the above claim(s) *10-21* is/are withdrawn from consideration.

5)☒ Claim(s) *1,2,8 and 9* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11132003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

METHOD AND APPARATUS FOR REGENERATING THE PERFORMANCE OF A PEM FUEL CELL

Examiner: Yuan S.N. 10/712,913 Art Unit: 1745 March 3, 2006

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

I, claims 1,2,8,9, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode potential to below 0.50 volt, and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

II, claims 10,11, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode potential to below 0:50 volt, said procedures including the steps of disconnecting the primary electricity using device from the external circuit and connecting an auxiliary resistive load in its place and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

III, claim 12, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode

while operating the cell using procedures selected to reduce the cathode potential to below 0.50 volt, and increasing the oxidant utilization to at least 70% for the second period of time and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

IV, claim 13, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode potential to below 0.50 volt and increasing the current for the second period of time, and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

V, claim 14, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode potential to below 0.50 volt and disconnecting the primary electr4icity using device from the circuit and connecting an auxiliary resistive e load in its place, and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

VI, claim 15, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, regenerating the cell, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode potential to below 0.50 volt and disconnecting the primary electricity using device from the

circuit and leaving the circuit open until the cathode potential falls to below 0.50 volt, and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

VII, claims 16,17, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, regenerating the cell, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode potential to below 0.50 volt and disconnecting the primary electricity using device and replacing it with a power supply in the external circuit, and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

VIII, claim 18, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, regenerating the cell, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode potential to below 0.50 volt and stopping the flow of oxidant to the cell and replacing it with a flow of gas selected form the group consisting of carbon dioxide, methane, natural gas, propane, and butane, and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

IX, claim 19, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, regenerating the cell, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode

potential to below 0.50 volt, and stopping the flow of oxidant to the cell and replacing it with a flow of gas selected form the group consisting of carbon dioxide, methane, natural gas, propane, and butane, and disconnecting the primary electricity using device form the circuit and connecting an auxiliary resistive load in its place and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

X, claim 20, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, regenerating the cell, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode potential to below 0.50 volt and disconnecting the primary electricity using device from the circuit and leaving the circuit open until the cathode potential falls to below 0.5 volt, and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

XI, claim 21, drawn to a method of operating a fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and oxygen containing oxidant to the cathode, regenerating the cell, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while operating the cell using procedures selected to reduce the cathode potential to below 0.50 volt and with an auxiliary resistive load connected across the cell, stopping the flow of oxidant to the cell and allowing the oxidant remaining within the cell to be consumed at the cathode creating a current flow thought the auxiliary resistive load, and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time.

2. These added claims (claims 10-21) are treated as constructively non-elected and thus are withdrawn from consideration. See MPEP 1450. The prosecution of this case is closed except for consideration of the above matter.

Allowable Subject Matter

3. Claims 1,2,8,9 are allowed. The invention of independent claim 1 recites a method of operating a PEM fuel cell comprising the steps of (A) providing a hydrogen containing fuel to the anode and an oxygen containing oxidant tot the cathode, (B) regenerating the cell after step A by a) providing a hydrogen containing fuel to the anode while using procedures selected to reduce the cathode potential to below 0.50 volt, and b) maintaining the cathode potential below the 0.50 volt for a second period of time sufficient to essentially restore the cell performance decrease which occurred during the course of step A and (C) sequentially repeating steps A and B to reduce the decrease in cell performance over time. The closest prior art of record, Molter et al. and Katz, does not teach or suggest the method to operate a PEM fuel cell as stated in the claim.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
March 3, 2006

DAH-WEI YUAN
PRIMARY EXAMINER